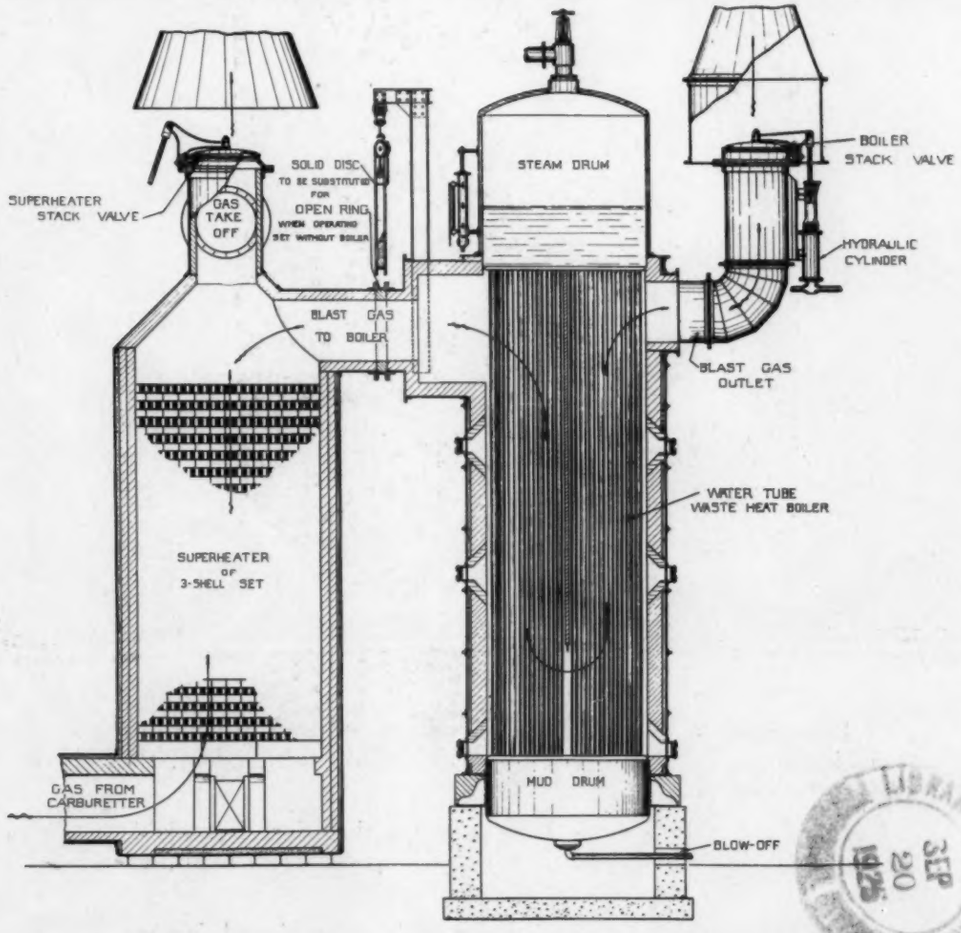
AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry

VOL. 122. NO. 21.
WHOLE NO. 3521.

NEW YORK, SATURDAY, MAY 23, 1925

Subscription, $5 Per Year
$6 Canada $8 Foreign



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Engineers and Founders

BALTIMORE **NEW YORK**

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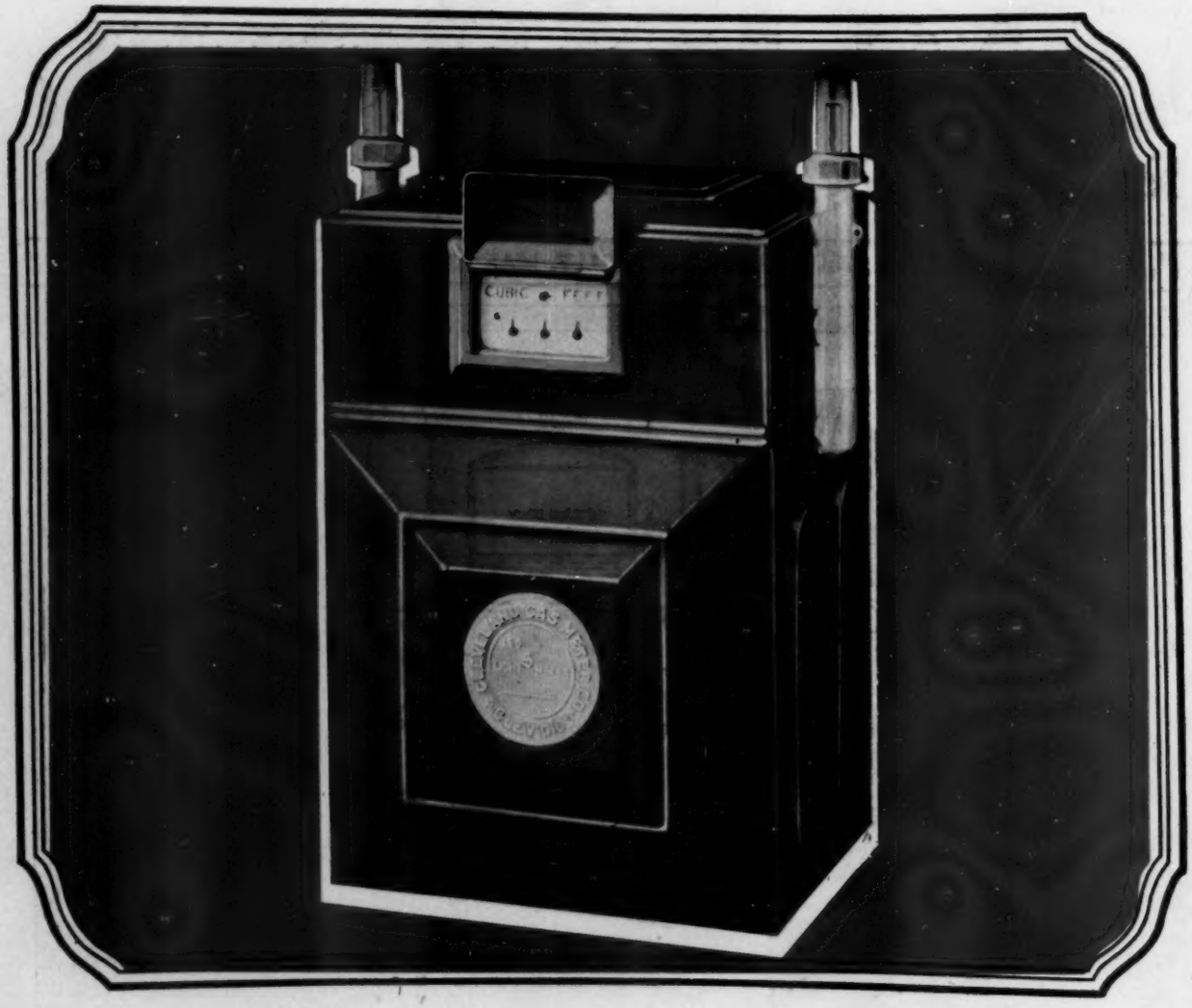

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CLEVELAND GAS METER COMPANY

2180 East 65th Street **Cleveland, Ohio**

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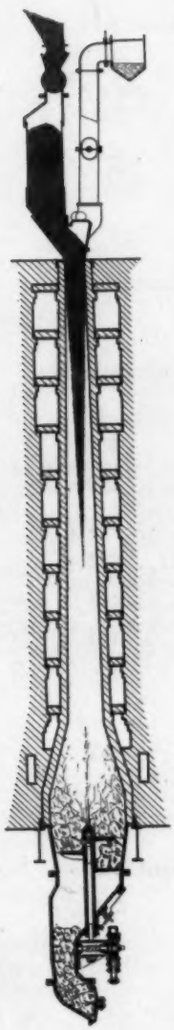
Vertical Retorts

American Installations



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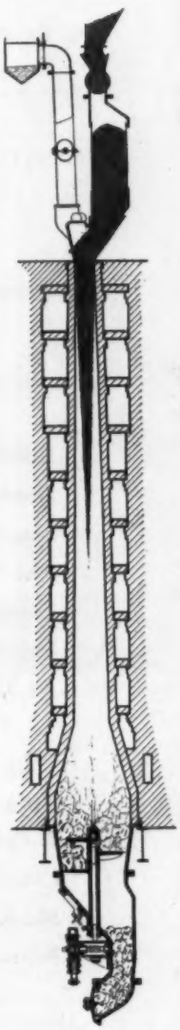

WEST GAS IMPROVEMENT CO.
of America, Inc.
441 Lexington Ave. New York.

American Gas Journal

SIXTY-SIXTH YEAR

Published Weekly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.

S. G. KRAKE, Pres. & Treas. C. S. MYERS, Vice-Pres. A. M. GLEASON, Sec'y.

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"MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS"

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Subscription $3.00 per year, including postage, in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines; in Canada, $4.00; foreign, $5.00—Single Copies, 10 cents.

AMERICAN GAS JOURNAL, May 23, 1925. Vol. 122. No. 21.
Published weekly by American Gas Light Journal, Inc., New York, N. Y.
Entered as second-class matter Jan. 9, 1917, at the post-office at New York, N. Y., under the Act of March 3, 1879.

AMERICAN
GAS JOURNAL

Vol. 122. No. 21 NEW YORK, MAY 23, 1925 Whole No. 3521

Breaking Electric Range Competition

Bluefield sold 153 gas ranges in one month

C. E. Reese

Bluefield Gas & Power Co., Bluefield, W. Va.

IF the families along your gas mains have been bitten by the electric range bug, our experience will help you add a large number of gas consumers.

It happened this way: We began a drive for one month, on the 22nd of last September, on direct action gas ranges. It was a 99-cent sale, that is, 99 cents down and 18 months to pay the balance.

Demonstrations Get Attention

We began the sale with three days of demonstration. On the first day a complete meal was prepared in the oven and served to 35 guests. On the second day the "Ham What Am" was cooked and served to 73 ladies, who ate every morsel of it with paper forks. There was also some canning of fruits and vegetables, in the oven, while the ham was cooking. The large audience on the second day showed that something radical must be done before the third day came, so we got busy in the evening and moved our meter shop from the second floor of the office to the plant and then moved our office upstairs. Our hunch turned out right, for on the third day 108 ladies watched the baking of angel food cakes. One or two ladies nearly lost their breath when the cakes were taken out of the oven and passed through the audience. However, the cakes all looked and tasted the same when baked. Contrary to usual results with direct action range sales, we sold six ranges during the three demonstration days.

You will note that the sales extended over the discount period. This enabled us to make direct contact with our customers paying bills. The results were pleasing.

Domestic Science Class

The third day's demonstration was followed with a special feature when an oven dinner was prepared and served to Miss Elizabeth McClung and her Domestic Science class of the Beaver High School assembled in our appliance room. The 85 girls of these classes were the most attentive visitors of the four days. We have traced a number of gas range sales to their attendance.

Cards for Follow Up

During these four demonstrations cards were distributed and prizes given to the holder of the lucky card drawn from a hat by one of the children present. We used the cards and followed up each visitor with direct action literature, which included "17 Reasons Why You Should Sell Your Old Stove and Buy a Direct Action Gas Range," and other folders.

We also sent out Thanksgiving and Christmas menus and fruit cake recipes which created a desire for the stove that could cook them. On the day following each sale a complete set of menus was mailed to the customer and each regulator accurately adjusted against a good thermometer.

During the sale appropriate space was carried in the Daily Telegraph, but the most effective ads used were strips across seven columns at the bottom of the page, reading, "First Car Load of Gas Ranges Sold," "Another Car Load of Gas Ranges Sold," and "Sign for That Direct Action Gas Range Today."

Each of our Dodge service trucks carried posters on each side which read as follows: "99c Places a Direct Action Range in Your Home." They got attention.

Demonstration at Negro College

On the 17th and 18th of November Mr. Timberlake, the demonstrator, was again in Bluefield, and the thought occurred to us that it would be a good

stunt to go over to the Bluefield Colored Institute and demonstrate to the domestic science class on the three direct action ranges, which we had just installed in the Domestic Science kitchen. The first day the whole meal was cooked in the oven and on the second two "Hams What Am" were baked. Much to our surprise, a large number of negro women attended these demonstrations. The college is on the edge of Bluefield and some of them came out in taxis. The card system was again used and prizes given. The follow-up mails have proven worth while, in spite of the fact that a large number of the girls live in neighboring cities. The Domestic Science rooms were packed both days with the most attentive audience I have ever seen on such an occasion. We have had a number of examples of the value of these two days' demonstration, since the negroes of Bluefield are extensively employed as domestics in the wealthy homes.

A Domestic Science Kitchen, Bluefield Gas and Power Company

More Speed and Better Food

One day a test was made to determine the speed and temperature required for baking fruit cakes in the gas and electric ranges. The two ladies baking the cakes live on opposite sides of the same street. Two five-pound fruit cakes were placed in the gas oven and the regulator set at 250 degrees. Two five-pound fruit cakes were placed in the electric oven and the regulator set at 275 degrees. The cakes in the gas oven were brown and perfect in four hours and ten minutes, while the cakes in the electric oven were brown, but sticky on the sides and tops at the end of four hours and twenty minutes.

A 3 for 1 Investment

Another interesting case is that of one direct action range customer who is an especially good pastry cook. During 28 days she baked 1,000 pounds of fruit cakes. Her gas bill was only $4.20, the top rate being $2 a thousand. She operated her stove on two bakes by placing 32 pounds of fruit cake in the oven at 8 a. m. and 30 pounds again at 1 p. m. This gave her four hours during the baking to deliver the previous day's baking and to take orders. During these 28 days her net profits paid for the stove three times.

Demonstration of Quick Action Gas Range

Fitter Team Work

During the sale there was a prize offered to the fitter who turned in the largest number of prospects who were in turn sold. The prize was the best hat in town. The prize was won by Mr. Hunter Kirby, shop foreman. The second ham and plenty other good things to eat were served to the fitters and helpers at a special gathering in the office at the close of the sale.

During this month everybody was selling gas stoves, but the busiest one of all was our commercial manager, Mr. C. M. Corling, or Major Corling, the Virginian, F. F. V., as everyone knows him.

President Whetstone Well Pleased

A daily record was kept of sales and a report mailed to Mr. Walter Whetstone, president of the Southern Gas & Power Corporation, Philadelphia. The ranges sold by weeks were as follows: 22, 37, 26, 27, and during the last three days of the sale we sold 41. The best day of all was the last, with 24 ranges sold. During the sale we removed five electric ranges and sold seven electric prospects. Since then we have been displaying electric ranges as a matter of routine, because direct action gas ranges are more economical and the food is better. When Mr. Whetstone received the final score of 153 ranges sold, he wrote as follows: "Dear Mr. Reese: I congratulate you heartily on your success in the gas range sale and taking out five electric ranges and selling seven electric prospects. This is great work."

Production and Use of Coal

Properties that coke must have for various applications

Dr. Carl Schwalbe

(Coke is probably the most important by-product in the manufacture of gas. The methods that are now used in gas making, even when water gas is made at the same works that coal gas is manufactured and the coke produced in the latter is employed as fuel in the former, yield large amounts of coke which has to be disposed of, and at a profit at that, in order that the gas company function properly from the economic standpoint. Thus the question of coke manufacture and coke use is one that most gas men are interested in and the remarks, that the well-known German gas man, Dr. Schwalbe, has to make on this subject, will be of interest. The following translation is a much abbreviated reproduction of the original article which appeared in the Das Gas und Wasserfach.—Trans.) . . . . . .

COKING coal, in other words, gas coal, and the coal that is used purposely for manufacture into coke, occupies an intermediate position between the anthracites and coal that contains much volatile matter, viz., soft coal. Coking coal is the only species of coal that can yield a good quality of coke. The gas works and the coke plants both use this kind of coal, the former employing varieties that contain more volatile matter and yield both gas and merchantable coke, while the coke plants use the older variety of the coal, which simply gives a high-grade coke. A coal that contains between 30 and 32 per cent of volatile matter is considered ideal for the gas works, while one containing between 19 and 21 per cent volatile matter is ideal for coke making.

Conditions Governing the Value of Gas Coke

The various properties that govern the value of the coke that is produced in the gas works may be summarized as follows:

1. Size of the coke, percentage of coke breeze.
2. Resistance against mechanical influences, tendency to fall apart.
3. Hardness and resistance to pressure.
4. Color and timbre.
5. Content of water and ash.
6. Ease of ignition and reactivity.

The formation of coke breeze or coke dust depends not so much on the coal and the character of the apparatus in which the coke is produced as on the handling that the coke receives between the furnace in which it is manufactured and its ultimate consumption. Many articles have appeared in the literature describing the vital relationship that exists between the manner in which the coke is quenched and transported and its ultimate value. One factor of importance is the size of the coke and the question arises as to what size differentiates between good coke and coke breeze.

When the size of the particles are from 10 to 30 millimeters, then it may be held that the quality of the coke is satisfactory from this standpoint. A plant that will use coke between 5 and 30 millimeters in size may be considered, under certain conditions, as degasifying coke breeze.

On the other hand, coke with pieces the size of a man's hand are useful for certain industrial purposes. Then, again, for certain domestic purposes the coke cannot be conveniently used when of such size.

Resistance of Coke Against Shock and Tendency to Crumble

The resistance of coke to shock and its tendency to crumble are properties that are not related to its hardness and strength. In certain cases it is possible to obtain a soft coke, which is considered less sensitive to these influences than a much harder coke, and similarly a loosely constituted coke may sometimes give a much better result than one which is of much denser structure. Thus a light coke, when dropped from a height of 3.5 meters, was found to be more durable than a considerably denser and harder coke that was obtained from vertical ovens which were intermittently operated. A few of the outer cells of the coke were broken off and the damage done to the piece of coke was nothing further. It behaved considerably better than a hard piece of coke which was honeycombed with numerous cracks.

On the other hand, the tendency of the coke to crumble is considerably more marked in the case of the soft coke. In recent times it has been learned how to protect the coke against this action, which is produced by the particles rubbing up against each other in the pile by suitably constructing the apparatus that is employed in carting and transporting the fuel around. New methods of degasification, such as the low temperature carbonization process and the degasification of the coal in continuous oven, on the other hand, have had a most important effect on the tendency of the coke to crumble. Consequently at the present time it may be said that the importance of the crumbling property of the coke is greater than that of its resistance to shock on being dropped, which has been generally called the most significant property of coke. The value of the drop test remains, however, for it shows in simplest manner what tendency the coke has to split up.

Hardness and Mechanical Strength

The hardness of the coke is its most important property from the standpoint of transporting devices. It generally runs hand in hand with the resistance of the coke to mechanical influences, that is, its strength. In the case of gas coke, the hardness of the product is more significant in the dry than in the wet condition. The mechanical strength of the coke is, of course, its most important property from the standpoint of the blast furnace and cupola operations. As far as gas coke is concerned, this property is of little importance. The mechanical strength of the coke varies between 70 and 250 kilograms per square centimeter.

Ash and Water Content

The ash content of the coke may be considered as due to causes that are outside of the control of the gas engineer, but, on the other hand, the moisture content of the coke is something that is within his control. In this connection it appears rather characteristic to the writer that, in spite of the many well-known advantages of the dry coke cooling process, it cannot be used in the average gas works for the reason that gas coke must contain

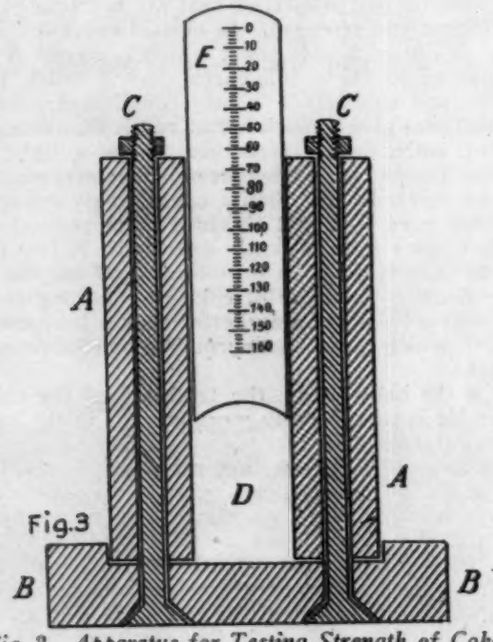


Fig. 3—Apparatus for Testing Strength of Coke

a certain percentage of moisture in order to be available for gas-making purposes. There is no fear that the value of the gas coke will be endangered, due to the fact that it might contain water, but that this would be objected to by the purchaser. In cases where the coke is allowed to remain on the

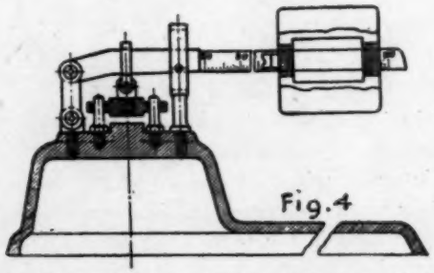


Fig. 4—Another Form of Strength Testing Apparatus

storage pile for some time in order to dry out, this disadvantage of moisture in the fuel can be eliminated. On the other hand, where the coke is employed directly for firing, then the presence of 10 per cent moisture in the fuel connotes a loss of heat by evaporation and in the sensible heat content of the steam vapors amounting to from 13 to 17 per cent. It is, however, of importance to remember that the wet coke is rather considerably less resistant to mechanical influence than the dry coke.

Color and Timbre

Color and timbre, as far as gas coke is concerned, have no direct effect on the value of the coke as a fuel. They are, however, indications of the quality of the coke on which the layman has seen fit to place particular stress. Thus, poorly degasified coke, containing considerable moisture, is not only brittle, but dark colored. Then, again, the colors that are obtained in the cake, when the product is quenched with dirty water, are also suspicious signs to the layman that all is not well with the coke. That timbre and dryness and timbre and strength have a certain relationship with one another makes this test of importance to the laity who can easily carry it out. It is, therefore, necessary that the gas works produce a coke which possesses these desired properties, if a good price is to be obtained for it. It must be mentioned that the dark color of gas coke is at times due not only to improper degasification of the coal, but also to the processes which take place during the carbonization and result in the formation of graphite.

Ease of Ignition and Reactivity

These two important properties of coke, which appear to run parallel to one another, have been considered with new interest during recent times. It has been brought out from researches that the reactivity of a coke is an important property from the standpoint of the blast furnace reactions. Considerable work has been done along these lines in the effort to define this relationship with exactitude.

The ease of ignition of coke is an important factor

(Continued on page 451)

GAS MERCHANDISING

Domestic – Industrial

Ideas for the Man Who Sells

William H. Matlack

WHY SOME SALES FALL FLAT

A MAN who travels the territory told us the other day that he had seen a number of what seemed to be promising "sales" fall flat last year. When he investigated the matter, the reason for failure was, without exception, that in some manner each and every one of the so-called special inducement sales had a string tied to it in some way and the moment the customer discovered this string he backed away from the dotted line. We have noticed this in other so-called sales—it was a good proposition—"if" or "but," and it is our idea that the fewer obstructions on places before the customer the greater will be the sales volume. No strings on any sales we ever put over is our war cry.

FEEDING FOLKS TO SELL 'EM

STRANGERS visiting Augusta, Georgia, don't quite understand at times where so many walking along Broad street are going. To gas appliance salesmen who visit Augusta, however, it's no secret, for they know that Manager May and Fred Eve must be staging one of their feeds. When the "peddler" reaches the Richmond and has registered, he then goes out to Broad street before deciding where he will eat. If he sees men, women

and children munching as they meander along, he's off to the gas company's office. For he knows that Miss Cephalie Lewis, the young lady in charge of the company's Home Service Department, is staging a feed, and when Miss Lewis reigns over the gas range he feels assured of some real Southern cooking.

Some time ago about every one on Broad street was eating popcorn. The company staged a small appliance sale with a pop-corn popper as the leader and, in order to sell it right, demonstrations were conducted. Just prior to this the company had a small appliance sale in which the waffle iron was a leader and all day long hot waffles were served to all comers. The gas company inaugurated this method of demonstrating early last fall, when they were introducing a fireless type of gas range. As it proved a big drawing card, they have used it ever since.

THE GAS LIGHT COMPANY
OF AUGUSTA.

Crisp Brown Toast

What is more appetizing on a crisp cold morning for breakfast, than good toast?

Have Toast Tomorrow

Buy a Gas Toaster and Try This
Recipe by Miss Cephalie Lewis

CHEESE CANAPES

Toast circular pieces of bread, sprinkle with a thick layer of cheese that has been grated, and seasoned with salt and cayenne. Place in a tin sheet and bake until cheese is melted. Serve at once.

Gas Toasters Save Gas and Make Four Delicious Pieces of Toast at a Time. Price, 50c.

GAS SERVICE
THE SERVANT THAT NEVER QUITS

The "Buy Your Home" Movement

Its value to the gas company

Joseph W. Piatt

The Brooklyn Union Gas Company

GREAT oaks from little acorns grow," is a figure of speech that may appropriately be applied to the growth of cities and their public utilities.

The suburban districts lying about all cities present a constant invitation to all who have the home-building instinct, and that means the great majority of us.

It is obvious that building material concerns and plumbing and heating contractors are vitally interested in the development of new homes and the up-

A Corner View of the Brooklyn Union Gas Co. Exhibit at the Brooklyn "Own Your Home" Show

building of suburban districts. There are advertising possibilities in the "Buy Your Own Home" shows that should appeal to the New Business Department of a gas company. The attention of the public should be drawn to these shows and the opportunity should be taken of telling them of the advantages of better equipped homes in the suburban districts where they now reside. The consequent sale of merchandise for this purpose should be large.

Increase of Gas Sales

In reality, such movements are of great importance to gas companies from the standpoint of increasing their gas sales. The rapid growth of a city of the magnitude of New York makes what was suburban last year urban this year, and it is quite essential that the gas company be in a position to place its service at the disposal of these homes.

It is much better to go into the new territory with the new inhabitants than to wait until the district is built up and filled with houses in which some other fuel is used and no provision is made for gas. All gas companies are familiar with the difficulties found in a coal-fired territory when the gas mains begin to enter such a district. All the house owners may eventually be converted to the use of gas, but not with the same ease and rapidity if the gas company goes along with the architects, builders, contractors and buyers.

Educating Builders and Architects

In the latter case, architects and builders can be educated to install adequate gas piping, properly located, and sufficient gas outlets and gas appliances of approved design, and services can be run into houses that are piped for gas and everything made ready to furnish the latest improvements. It gives the gas company a chance to do it much better with gas than if it waited until gas mains were laid in paved streets that had to be dug up and relaid, and services were run into the few houses where the owners are ready to install gas, followed here and there spasmodically by the remainder, who would have taken it in the beginning if they were positive that they were to have it.

While gas mains may not go along co-ordinately with house building, yet they may follow quickly even before pavements are laid, if some method of encouraging the prospective home builder to use gas is available so that he will prepare his house by installing the necessary piping along with similar action upon the part of his neighbors.

Showing New Gas Appliances at the Shows

What better method can be found to show the different appliances that add to the quality and convenience of a home than through the exhibitions devoted to the "Buy Your Own Home" movement? It is instructive, not only to the prospective home owner, but has an educational value in assisting the real estate dealer, the contractor and the house furnisher in what is best to offer in the way of proper gas appliances for lighting, heating and cooking.

(Continued on page 453)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 71

Heat and Change of State

Table of Latent Heats of Substances

The latent heat is a characteristic property of any substance. Each substance possesses its own latent heat. This factor is generally expressed in terms of British thermal units per pound or calories per gram. The following table contains the latent heats of fusion of some of the most important elements and substances:

	B.t.u. per pound
Aluminum	432
Beeswax	76.14
Bismuth	22.75
Bromine	29.12
Cadmium	24.58
Cast iron, gray	41.4
Cast iron, white	59.4
Gallium	34.40
Ice	144
Lead	9.66
Mercury	10.8
Copper	77.4
Palladium	65.34
Nickel	8.35
Paraffine	63.27
Ammonia	195
Benzol	55.5
Phosphorus	9.06
Tin	25.65
Zinc	50.63
Silver	37.93
Spermaceti	66.56
Sulphur	16.86
Platinum	48.90
Potassium nitrate	85.26
Steel	36.00
	Calories per gram
Antimony	38.9
Argon	6.71
Beryylium	34.1
Chlorine	23.0
Chromium	32
Iron, pure	59.4
Iron, 4.35 per cent carbon	59
Gold	15.9
Potassium	15.7
Cobalt	58.2
Magnesium	72
Sodium	26
Manganese	36.7
Oxygen	3.3
Tellurium	7.4
Hydrogen	15
Calcium chloride	40.7
Carbon dioxide	43.8
Carbon monoxide	8
Sodium chloride	123.5
Sodium hydroxide	40.0
Sodium nitrate	62.97
Sodium sulphate	51.2
Nitric acid	9.54
Sulphuric acid	22.82
Acetic acid	46.4
Glycerine	42.5
Aniline	20.95
Phenol	24.9
Alloys: 30.5 lead, 69.5 tin	17
36.9 lead, 63.1 tin	15.5
63.7 lead, 36.3 tin	11.6
77.8 lead, 22.2 tin	9.54
Britannia metal, 9 parts tin, 1 part lead	28
Rose's alloy, 24 lead, 27.3 bismuth and 48.7 tin	6.85
Wood's alloy, 25.8 lead, 14.7 tin, 52.4 bismuth, 7 cadmium	8.40
Iodine	11.71
Napthalene	35.62
Iron, slag	50.0

CO-OPERATION BETWEEN PRODUCERS AND USERS OF GAS FUEL MARKS NEW PHASE IN INDUSTRIAL PROGRESS

Both gas companies and the gas-consuming public will be benefited by an industrial campaign which has been launched by the gas companies of the country under the leadership of the American Gas Association, to make gas the universal heating medium.

More than a hundred of the largest gas companies have made or are making industrial heating surveys of their territories, and it is believed that such communities will be aided by this information in attracting new industries to their midst.

Along with this movement is the establishment by an increasing number of gas companies of industrial service departments. The policy of these departments is to help industrial fuel users to get the most economical use of their equipment regardless of the fuel which is being used at the time. Such co-operation between the producers and users of fuel is said to introduce a new phase in industrial progress.

Frequently the advantages of changing over to gas burning equipment is so obvious that this is the only advice that can be offered. However, it is the function of the industrial gas engineer to sell heat, not any particular appliance.

One gas company, situated in New York City, has on its books the record of a well-known engraver who within a short space of time changed his heating installation from coal to electricity, from electricity to gas, then back to electricity, and now, finally, after three months' careful trial and experimenting, with the help of the gas company's best utilization engineers, he has gone completely over to city gas, with a consequent material saving in operating costs.

Whereas it was necessary to have in working order and ready to use at all times twelve of the electric machines, it was found that the plant could run at full capacity and not need more than seven of the gas ovens. The total two months' gas and electric bill in 1923 before making the conversion was $718. In 1924, after making the change over to gas for the heating operations, the total bill was only $283. In the latter period 50 per cent more business was handled than in the former.

Dry Sterilization of Mattresses*

Gas as an agent in the interest of public health

Thomas Telfer

New Business Department, San Francisco Division, Pacific Coast Gas & Electric Corporation

IN 1923 the California State Board of Health adopted regulations governing the sterilization of mattresses and other like materials. In due course a plant was established for this purpose in San Francisco. This plant is worked on a commercial basis and the business is limited almost entirely to fulfilling the sterilizing requirements on mattresses and pillows.

The particular section of the law governing mattresses and pillows requires a dry heat of 230 degrees Fahrenheit maintained for 30 minutes. To meet these conditions an oven was constructed to give an even heat throughout. A cold spot brought up to temperature would mean a resulting hot spot in another section with scorching effect upon the materials being sterilized.

Importance of Temperature

It was found that the average article would scorch at 275 degrees Fahrenheit. Some of the lighter and less expensive materials scorched at much lower temperature.

Exterior of Sterilizing Plant

The firing of the oven presented a variety of requirements to produce the necessary heat, quickly, accurately and eventually. The maximum burner capacity must give 230 degrees Fahrenheit within two or three minutes after a load has been placed in the oven, and yet have a minimum burner capacity small enough to just hold at 230 degrees Fahrenheit or drop a few degrees. To furnish an evenly heated atmosphere at all times a system of quick recirculation was necessary, and this also helped considerably in giving a fast temperature rise. A torch or carriage was essential to the operation as no loading could be done in direct contact with the heat of the room. The construction of the truck had to be such that it would be easily and quickly unloaded, reloaded and moved.

Design of Oven

The oven was built in sections with tongue and groove joints, the walls being of heavy sheet metal filled with insulating powder. This construction gave a three-inch wall of insulated material. The sections were bound into a unit by angle iron corners and braces with longitudinal tie-rods belted tight. The inside dimensions of the oven are 6x13x 8 feet. The roof sections were made to cap over the side walls, giving a tight seal on the top, while the base was sealed by grouting into a channel iron frame set in a groove in a concrete floor.

A counter-balanced door was provided of the same general construction as the walls of the oven, making up practically the full size of the front wall.

Firing Equipment

Surface combustion law pressure equipment is used for firing, with air at one pound from a positive pressure blower. The air from the oven is drawn into a fan blower and blown through a large pipe down into the combustion chamber. A single burner is used which fires through a tunnel directly into

(Continued on page 454)

*Pacific Coast Magazine.

As The Journal Views It

SYNTHETIC METHANOL

Undoubtedly gas men have been interested in the reports that have appeared in the newspapers throughout the entire country relative to a new process which has been developed in Germany for the manufacture of methanol. Methanol is simply another name for wood alcohol, having been chosen with the express intention of removing the designation "alcohol" from the vicious, poisonous and blinding chemical, methyl alcohol, or wood alcohol.

The new substance, synthetic methanol, is nothing more than wood alcohol of high degree of purity containing none of the impurities that are commonly found in the product that is distilled from hard wood, and which gives to it its characteristic penetrating and disagreeable odor. It is surprising to see that this new product, developed abroad and now being imported in ever-increasing quantities into this country, should be called non-poisonous in the newspaper stories.

It is decidedly poisonous and even more dangerous than wood alcohol, for its presence can scarcely be detected because of the absence of the characteristic odor of wood alcohol.

The question may well be asked: "What interest has this to the gas man?" The answer is, "A very decided one." For synthetic methanol is made from a mixture of carbon monoxide and hydrogen, which is nothing more than water gas. German chemists and technologists, after six years of intensive labor, have succeeded in making these two gases combine to give the product methanol. And not only that, but at a cost which is considerably less than that entailed in the manufacture of methanol by the distillation of hard wood. Thus gas, water gas specifically, has assumed an added importance in becoming the starting point for the manufacture of a very important industrial chemical.

A lesson to be derived from the successful synthesis of methanol from water gas is that the intensive research and application of chemists and technologists, intelligently directed and supervised, will solve most any problem and will yield results that far more than repay the efforts and expense involved in such an enterprise. It serves to open the eyes of the gas men to the fact that their industry manufactures products that have even greater potential significance than they could possibly imagine. It brings back to mind that in the gas manufacturing process we are dealing with a basic raw material from which there has been developed not only a gas industry, but entire series of chemical industries in which simple substances, obtained as by-products of coal, are manufactured into important industrial chemicals, brilliant dye-stuffs, delicate perfumes and health-giving and disease-combating drugs.

Thus perseverant research and application has again produced results. In spite of economic barriers such as tariffs, taxes, etc., modern chemistry has been successful in evolving processes which overcome all these artificial obstacles. It thus appears that manufacture protected in this manner is only temporarily secure and the only safe and sure way in which supremacy in any industry may be maintained is by constant research and experimentation to develop new methods and new products and thereby decrease costs of production and meet competition by manufacturing cheaper and better products. It is clearly indicated to the American chemical industry, and this pertains to a certain extent to the gas industry as well, that it can maintain its position of security, not only in a foreign, but in a domestic market as well, only through enlisting the aid of research chemists and engineers who are kept working constantly to perfect existing processes and to evolve new ones and thus maintain the industry at a high degree of efficiency.

An additional lesson may be derived therefrom and applied to gas. If gas is to continue to be a contender in the industrial field, and if it is eventually to attain its goal as the universal fuel of industry, the gas company must be willing to spend considerable time and money in research and development, not only in finding new uses for industrial gas, but also in evolving new processes for its manufacture which will reduce the cost of the product and enable gaseous fuel successfully to compete with others.

Why and How Do You Sell?

A few fundamentals of successful selling

Lester G. Herbert

SOME people are indifferent salesmen because they only see their own side of the business proposition. They try to sell in order to make a living or to get a certain amount of money or to fill a position well enough to be retained on the payroll.

Such folks can never expect to climb very high, because their ideals or the platform on which they stand are not very lofty.

What Is Real Salesmanship?

That viewpoint of salesmanship which has to do with self only is necessarily selfish and people who are purely selfish cannot hope to challenge the interest or confidence of others. Real salesmanship of a high order is that which uncovers a need and seeks to meet it or to fill it worthily. When we gain that viewpoint we have climbed into the sunlight and out of the selfish atmosphere which always restricts us.

We can never hope to sell successfully when we merely aim to market or unload what we have on hand. When we do that we may force some sales, but they will scarcely be repeaters and we cannot depend upon building up a following which will be loyal and permanent.

Study the Public Need

But if we plan to study the public need and to meet that need in just the way we ought, then we are on the right track and we are performing a service that will entitle us to continued patronage, to reasonable profits and to permanent prosperity.

We are now ready to answer the question, "Why do you sell?" The answer is, "To meet a real need —to serve satisfactorily!"

And in this connection we are entitled to remember that "He who serves best profits most." Any ideal short of this is not worthy of red-blooded American citizens. It is not sincere enough to make the right kind of an impression. It is tremendously important to get right in the beginning and to keep right. Otherwise, the farther we go along the branching pathway, the farther away we are from where we ought to be.

How to Sell

Just HOW we shall sell is likewise a matter of importance. Our years for getting results are necessarily limited and so we cannot afford to waste time.

We sell in two ways: First, by person approach; second, by advertising.

Personal Approach

Our personal approach must be as nearly right as we can make it. The goods are there to be shown, explained and demonstrated. Our part as salesmen is to discover the need which those goods meet, whether it be a luxury need, a necessity need, a recreational need or a cultural need. Sell the idea of that need satisfactorily and the goods will sell themselves. The more confidence people have in you and your business policy, and your fairness and reliability, the more readily they will accept your ideas. The more good will or friendliness they feel toward you the less will be the sales resistance against your ideas. So it is logical to build up confidence and good will and to maintain a fair and sound business policy. If we do this our personal approach in the selling of our goods will be efficient and successful.

Advertising

Advertising is the long, strong arm of business today. It reaches the people whom we cannot reach with our smile, or voice, or handclasp. Advertising has but one purpose. This purpose is the transference of sales ideas. To transfer ideas on paper we must use language and oftentimes illustrations. Poor advertising copy costs just as much for space and distribution as good copy. The language should be sincere. It should ring true. It should be graphic. That is, it should draw word pictures which will stir the imagination and awaken the interest of the one who reads. The advertisement is only efficient when its appearance is attractive and the sales copy is not only strong, but forceful enough to point out with certainty real needs and how well you are prepared to fill them. Advertising copy which falls short of this ideal fails to just that extent.

The Will to Do Better

There is nothing difficult or mysterious about "How" to make sales. Some people have the theory down pat, but they put off applying these principles and so do not get the benefit of them. Others satisfy themselves with the excuse of the weakling, which is, "I am doing as well as I can!" This is never good enough. We must do better than that and we must not be satisfied until we can honestly class ourselves with the best in our field. This calls for Action, and a lot of it. It calls for Vision. It calls for Initiative. It calls for Courage. It calls for Increasing Efficiency.

When we can analyze, and apply, and act, we will know for a certainty Why and How we sell. It is necessary to know, that we may discover how well we are doing it!

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

ACTIVITY OF IRON OXIDES AS PURIFYING MATERIAL

THIS is the subject of a paper that was recently published by the Bureau of Mines as technical paper No. 332. The results obtained in this investigation are summarized in the following:

1. The activity of iron oxides for H_2S is affected by water content. Each oxide has a best water content or range of water content. Increasing or decreasing the water content beyond this range decreases activity.

2. The activity of some oxides is confined to a very narrow range of water content, but the activity of other oxides may continue almost constant while their moisture content increases several hundred per cent.

3. The activity of dark red or black oxides is usually more sensitive to changes in water content than is the activity of the yellow or yellowish-brown oxides. The latter oxides are usually of lower specific gravity and retain more moisture when apparently dry.

4. An oxide that has been dried and then remoistened does not immediately regain the activity corresponding to its water content. Complete reabsorption may require several days or weeks. If the oxide is dried at temperature of 400 degrees C. it reabsorbs water even more slowly.

5. A thoroughly hydrated oxide that has sulphided and then revivified in the presence of plenty of water tends to resume the state of hydration which it had prior to sulphiding. A dehydrated oxide similarly treated tends to resume the dehydrated state even in the presence of excess water. From this it seems that throughout the sulphiding and revivifying process an oxide retains essentially the same physical structure.

6. The activity of oxides increases with increasing temperature to about 120 degrees F.; above that temperature some oxides show only a slight decrease of activity, others show more. In the authors' experiments the total change in activity between 40 degrees and 120 degrees F. amounted to about 10 per cent.

7. At very low H_2S concentrations, all the oxides tested showed nearly the same activity. With increasing H_2S concentrations the activities of all oxides decreased, though the decrease for some oxides was slight. Some oxides showed a minimum activity with concentrations of about 500 to 700 grains of H_2S per 100 cubic feet of gas and a slightly increased activity with increased concentrations of H_2S. Other oxides attained an almost constant activity with H_2S concentrations varying from 600 grains per 100 cubic feet to 1,000 grains, the highest concentration tried.

8. The relation between activity of oxide and H_2S concentration as determined from the laboratory test appears to be essentially the same as the relation between concentration and purification rate by the Steere formula for purifier design.

9. Most oxides that show high activity when fresh do not maintain this superiority when partly fouled. Of the oxides tested, one produced by rusting cast-iron borings maintained the most uniform activity, losing only 14.5 per cent of its activity when sulphided up to 80 per cent. With the same degree of sulphiding, the activity of the oxide that initially was most rapid in action decreased 62.5 per cent.

10. In all tests of the activity of oxides the gas contained no air. Had the gas contained air those oxides that were initially more rapid might have revivified more quickly and have maintained a higher average activity.

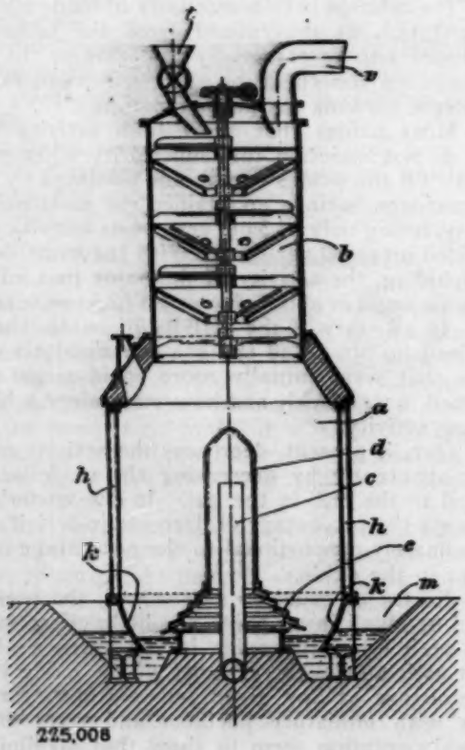
11. Tar, if present, decreases the activity of the oxide, apparently by decreasing the oxide surface exposed to the H_2S in the gas. In the writer's experiments the percentage of decrease in activity was approximately proportional to the percentage of tar present in the oxide.

12. So far as could be ascertained, the presence of acid or alkali in an oxide has little effect on the initial activity of the oxide in the absence of air, except as it affects the capacity of the oxide to retain moisture at any given temperature. Experiments with miniature purifiers and tests during practical operation seem to show that alkalinity is of definite advantage in improving activity, apparently because it promotes the formation of the more easily revivified sulphide of iron, Fe_2S_3.

GASIFYING COKE BREEZE

THE apparatus is for gasifying coke breeze, fine coke, coke dust from coke screenings, etc. The retort b is arranged above the producer a and contains a vertical rotating shaft carrying rotating arms for distributing the material. The material passes from conical shelves fixed at the periphery to alternate flat discs spaced at their peripheries from the retort wall. The blast pipe c for the producer is situated within a dome d above the grate e. The sides of the producer a are in the form of a water jacket h, for cooling purposes and generating the steam supplied to the blast pipe c. The lower end of the producer is shaped as shown at k, and enters a water seal m of suitable shape for the withdrawal of ash. In an alternative form, the bottom part of the producer is cylindrical, and a revolving ash extractor is provided. The coke breeze is supplied to the retort b through a hopper r, and the producer gas passes from a through the mate-

rial in the retort b to an outlet v. The coke breeze in the retort is heated and dried by the passage of the hot producer gases for 20-40 minutes, and reaches the top of the producer at about 400-450 degrees C. The temperature in the producer rises to about 1,000 degrees C. and is controlled by the water jacket h.



225,008

The saturation temperature of the blast is about 68-70 degrees C., and the pressure about 4-6 in. of water. This apparatus avoids the presence of dust passing out from the producer with the gas, such dust being intercepted by the retort b.—(British Patent No. 225,008).

A COKE PRIZE CONTEST

Fort Wayne Company Concentrates on Coke

The Northern Indiana Gas & Electric Company of Fort Wayne, Indiana, is using full-page advertisements in the Fort Wayne papers for the purpose of calling attention to a prize offer it is making to persons suggesting the best name for coke which will be sold in Fort Wayne.

The advertisements say: "To safeguard the public against inferior substitutions, we are going to adopt a distinctive trade name for the coke manufactured at our new plant. Suggestions are invited from Fort Wayne residents.

The prizes offered are as follows:First, $100; second, $50; third, $25; fourth, $10; fifth, $5; sixth, $5; seventh, $5.

The Conditions

The conditions of the contest are as follows:

1—The trade name must necessarily be short.

2—It must contain the word "Guaranteed."

3—It must convey the information that the coke is manufactured in Fort Wayne.

4—All suggestions should be sent to "Northern Indiana Gas & Electric Company, Coke Name Contest Department, Fort Wayne, Indiana."

5—Suggestions must be submitted not later than June 1, 1925.

6—The contest is open to every resident in Fort Wayne, irrespective of age, but no employee of the company, coal dealer or member of the family of either, will be allowed to participate.

The Coke Guarantee

The guarantee made by the concern about its coke is very interesting. It is as follows:

"If a ton or more of coke placed in your basement cannot for any reason be used satisfactorily in your furnace we agree to remove it at our expense and refund the purchase price."

The new plant, which represents an investment of $3,000,000, will turn out 66,000 tons of coke a year.

Following Up Deliveries

The company states that unless requested not to do so it will follow up the delivery of every ton of coke for the purpose of seeing these things:

First—That the coke was properly delivered and handled on the premises without unnecessary annoyance and in a clean and workmanlike manner.

Second—That the purchaser is thoroughly familiar with the very simple instructions necessary to properly burn the fuel.

The company's service representatives give free demonstrations when requested to do so. They start furnaces and operate the furnaces for reasonable lengths of time.

An Effective Window Display Featuring House Heating by Gas

Catechism of Central Station Gas Engineering in the United States

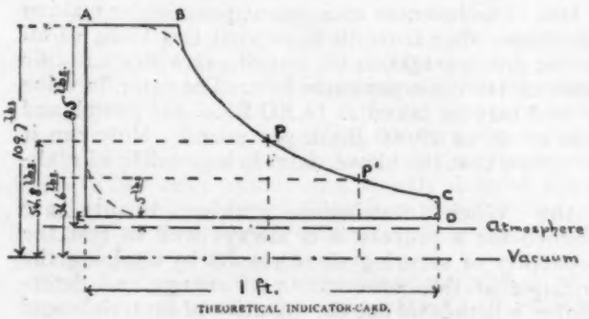
Installment No. 71

(Continued from last week)

Using the Indicator Card

If it is desired to use a theoretical indicator card to calculate the mean effective pressure, such a card can be constructed from the above data in the following manner:

Lay off on a vertical line the steam pressure in pounds per square inch above atmosphere. Lay off on a horizontal line intersecting this vertical line the stroke on any convenient scale. Then steam is admitted in the straight line A B, and expands along



THEORETICAL INDICATOR-CARD.

the line B C. At the point C, the exhaust valve opens to the atmosphere. The piston returns along the line D E against a pressure of 5 lb. above that of the atmosphere. The admission valve opens again at E, and the pressure immediately rises to what it was when admitted at the point A.

Card A B C D E A is, therefore, an ideal card for this engine, but we know that no engine can give an ideal card. The corners at B, C, D and E are not right angles, but curves, approximately as shown on the dotted lines. The most difficult thing about the construction of this card is the plotting of the curve B C. The points on this curve may be found as follows:

Making the Calculations

In this engine the volume of steam up to the point of cut-off B is 300 cubic inches. If we expand this volume until it occupies a space of 600 cubic inches, the absolute pressure will be one-half of the initial absolute pressure of 95 + 14.7 = 109.7 lb., or 54.8 lb., and by drawing the vacuum line as shown, 14.7 lb. below the atmospheric line on the same scale as was used for laying off the gauge pressures, and at half stroke drawing a vertical line and laying off on it 54.8 lb. above the vacuum line, the point P is obtained. Similarly, if we expand 300 cubic inches until it occupies three times that volume, the absolute pressure at the point P' will be one-third of what it was at B, or 36.6 lb. Similarly, we may get as many points on this curve as we choose, and by connecting them produce the line B C. From this card we figure the mean effective pressure just as we would from any other card.

For the case given above the mean effective pressure would be practically as obtained from the tables and the indicated horse-power would also be the same.

Boiler Efficiency

343. A boiler using a fuel with a calorific value of 14,000 B.t.u. per pound is shown by a test to be evaporating 8.9 lb. of water per pound of fuel used. The water is fed to the boiler at a temperature of 120 deg. F. and the gauge pressure is 100 lb. What is the efficiency of the boiler? Give your calculations.

Ans. From the steam tables it is found that the total heat above 32 deg. F. in a pound of saturated steam at a gauge pressure of 100 lb. is 1184.4 B.t.u. Since the water is fed into the boiler at a temperature of 120 deg. F., it already possesses a quantity of heat above 32 deg. F. equal to 120 — 32 = 88 B.t.u., so that there is imparted to it in the boiler, to convert it into steam at a gauge pressure of 100 lb., only 1184.4 — 88 = 1096.4 B.t.u. per pound. There being 8.9 lb. of steam formed under the given conditions for each pound of coal used, the heat put into the steam, that is, the useful work done, per pound of coal, is 1096.4 × 8.9 = 9757.96 B.t.u. The combustion of the coal produces 14,000 B.t.u. per pound. Since only 9757.96 of these are used, the efficiency of the boiler is 9757.96 ÷ 14.000 = 69.7 per cent.

Pounds of Water Evaporated

344. Assuming for the boiler an efficiency of 70 per cent, and the use of a fuel that will develop 14,000 heat units (British thermal units) per pound,

how many pounds of water will be evaporated per pound of fuel, the temperature of the feed water being 100 deg. F., and the working pressure 100 lb. per square inch?

Ans. Since it is assumed that the fuel develops 14,000 heat units per pound and that the efficiency of the boiler is 70 per cent, the heat available for the evaporation of water is $14,000 \times 0.70 = 9,800$ heat units per pound of fuel.

The quantity of heat required to turn one pound of water at 100 deg. F. into steam at 100 lb. gauge pressure can be calculated by means of the proper formula or taken direct from a table of the Properties of Saturated Steam, such a table being given in most books on boilers. From this we find that the total heat of evaporation above 32 deg. F. of steam at 114.7 lb. absolute pressure (= 100 lb. gauge pressure) is 1184.4 heat units. From this we must subtract the amount of heat required to raise the temperature of 1 lb. of water from 32 deg. to 100 deg., the assumed feed water temperature. This is 68 heat units and $1184.4 - 68 = 1116.4$ heat units. Consequently the number of pounds of water evaporated by one pound of fuel under the assumed conditions will be found by dividing 9,800, the number of heat units required to evaporate one pound of water under these conditions.

Therefore, $9800 \div 1116.4 = 8.78$ lb. of water will be evaporated per pound of fuel used.

Checking Up a Gas-Making Process

345. The "Principle of the Conservation of Energy," and how would you apply it to check up the claims made as to the results to be obtained from a new process for making gas?

Ans. The "Principles of the Conservation of Energy" is that the total energy of the universe is constant, no energy being created or destroyed in any of the processes of nature, every gain or loss in one form of energy corresponding precisely to a loss or gain in some other form or forms. (Century Dictionary.)

This principle follows from the still broader one, that "all that exists, whether matter or force, and in whatever form, is indestructible by any finite power," the truth of which has been, and is being, more and more firmly established by all the researches of science.

From it we reason that in no case the sum of the energies (actual and potential) possessed by the products of any combination of different forces or bodies be greater than the sum of the energies possessed by the original forces or bodies before they entered into combination. And in regard to machines "that it is impossible by any combination of natural forces to make a machine, whose parts being once set in motion and then left to the operation of gravity, or other similar forces, and their own mutual action, shall later return to their original positions with greater velocities" (and consequently greater energies) "than they at first possessed," or, in other words, it is impossible to make "a machine, which being put into motion, and left to itself, will in a certain time regain its original velocity, and at the same time impart to some body, originally at rest, a certain velocity."

To apply this principle to check up the claims made as to results obtained from any process for making gas it is merely necessary to determine the relation between the sums of the energies possessed by the products of the process and the sum of the energies possessed by the raw materials, but will never even equal them, since in making gas it is impossible to avoid losses by radiation of heat and also by heat carried away in the waste products. If, when the claims put forth are analyzed, it is seen that the total energy claimed to be available as a result of the process is greater than, or even exactly equal to, the total energy put in, these claims can safely be dismissed as absurd. In many cases it is very easy to disprove the claims made as to the results of gas making processes by a comparison between the sum of the heating values of the materials employed and that of the same values of the products, and although it may be difficult to make the comparison in some cases it will, when properly made, always tell whether the results reported are reasonable or not.

An Example of the Checking Up Process

346. The inventor of a patent process for making gas claims that from 10 lb. of coal and 15 lb. of oil he can produce 1,000 cubic feet of gas with a calorific value of 440 B.t.u. per cubic foot. The calorific value of coal may be taken as 13,500 B.t.u. per pound, and that of oil as 19,000 B.t.u. per pound. How can it be shown that the above claim is impossible of realization?

Ans. When wonderful working results are claimed for a process it is always well to test the possibility of securing these results by applying the principle of the conservation of energy and determining whether or not the quantity of materials said to be used is capable of supplying the energy which it is claimed exists in the products. In doing this it must be borne in mind that no process for making gas from solid or liquid bodies can have a thermal efficiency of 100 per cent, since some heat is required to overcome the attraction between the molecules of solid and liquid substances and convert them into gases, and also since it is impossible to avoid losses of heat by radiation and the sensible heat of the escaping waste products. The thermal efficiencies of the commonly employed processes for making gas vary from about 50 per cent to about 80 per cent.

According to the data given in the question, the total number of heat units in the materials in the quantity in which they are employed per 1,000 cubic feet of gas is equal to $10 \times 13,500 + 15 \times 19,000 = 135,000 + 285,000 = 420,000$, since 10 lb. of coal with a calorific value of 13,500 B.t.u. and 15 lb. of oil with a calorific value of 19,000 B.t.u. per pound are used to make this quantity of gas

(Seventy-second Installment Next Week)

PRODUCTION AND USE OF COKE

(Continued from page 440)

in its use on the traveling grate. Furthermore, this property of the fuel is important in its use in powder form for fuel purposes. Experiments, which the writer carried out on the ignition temperatures of different cokes, showed that there were great variations in the reactivity of the various grades of coke, a matter to which but little attention has been paid in the past. This property of coke is of considerable importance, not only from the standpoint of the processes that take place in the gas producer, but also in relation to those that occur in the manufacture of water gas.

The ignition temperatures of various products that are derived from the degasification process are contained in the following tabulation. These have been obtained by experiment.

Wood charcoal.....about 300 to 350 degrees C.
Half coke .....about 400 degrees C.
Gas coke .....about 500 degrees C.
Metallurgical coke..about 600 to 630 degrees C.
Graphite 730

Ignition Temperature and Reactivity

It has been doubted by certain technologists that the ignition temperature of coke has any direct bearing on the reactivity of the same. In the determination of the influence of the changes of the character of the coke on the institution of the equilibrium, $C + CO_2 = 2CO$ at different temperatures that are met with in the coking process, the author has been able to determine recently that the reactivity of the coke stands in a strictly definite relationship with the ignition temperature, so that a law may be formulated which connects these two important properties of the coke.

The results are shown in figures 1 and 2. In these curve diagrams the temperatures are shown as abscissae. The temperatures were obtained in an electric furnace in which the samples of coke were heated. The ordinates represent the percentage of carbon monoxide gas, as such, that is present in the carbon dioxide-carbon monoxide mixture. The speed of the heating was maintained constant so that the carbon dioxide gas was allowed to remain in contact

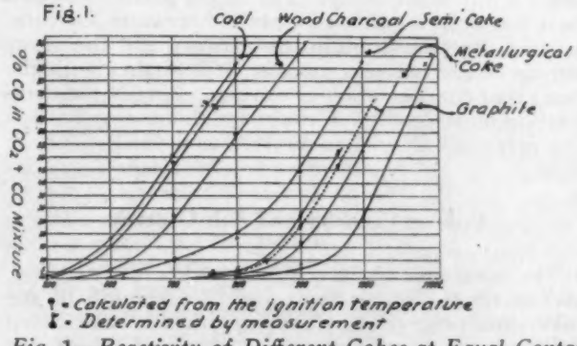


Fig. 1—Reactivity of Different Cokes at Equal Contact Periods

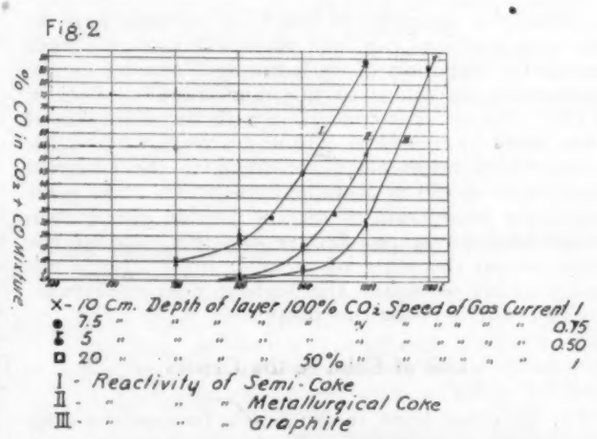


Fig. 2
% CO in CO₂ + CO Mixture
× - 10 Cm. Depth of layer 100% CO₂ Speed of Gas Current 1
• 7.5 " " " " " " " " " " " 0.75
ℓ 5 " " " " " " " " " " " 0.50
□ 20 " " " " 50% " " " " " " 1
I - Reactivity of Semi-Coke
II - " " " Metallurgical Coke
III - " " " Graphite

Fig. 2—Influence of the Duration of Contact

with the heated coke for an exact period of time, which remained constant in all cases. If, then, the temperatures at which residual percentages of carbon monoxide amounting to 5, 10, 20, etc., per cent, are found in the gases that are drawn from the electric furnace are plotted, and then if a curve is drawn connecting up these points it will be seen that there is a very definite relationship between the ignition temperature and the reactivity, and vice versa. Only in the case of semi-coke is there any deviation from the general rule that is established in this manner. The relationship is such a definite one that it is possible to establish another curve for a strongly heated semi-coke, which is shown in dotted lines on the figure, this curve lying between the curve for semi-coke and that for metallurgical coke. Then actual experimental tests were made, and it was found that the data obtained therefrom agreed absolutely with the empirically determined curves as explained above.

Causes of Variation in Reactivity

Much has been said regarding the reason why the reactivity of coke varies. It appears to the author at the outset that the most apparent reason was the fineness of the structure of the coke. Thus the finer the distribution of the particles of coke in the coke structure, the lower the temperature of ignition and the greater the reactivity. But it is impossible to lay down any definite law regarding the relationship between this property of the coke with the latter's tendency to graphitize or with its contents of iron. Experiments have not been able to substantiate any such theoretically developed relationship, but the truth of the above contention that there is a definite connection between the fineness of the coke structure and its reactivity has been proven by experiment, when the absorption of gases was taken as a measure of the surface properties of the coke.

The technical importance of realizing that different cokes, prepared in different ways, possess different degrees of reactivity, cannot be overestimated.

Thus, for example, in the blast furnace two reversible reactions can take place. One is concerned with the reduction of carbonic acid gas to carbon monoxide, according to the equation $CO_2 + C = 2\,CO$. The other is concerned with the reduction of iron oxide by means to carbon monoxide to metallic iron, which takes place according to the equation Iron oxide + CO = Metallic iron + CO_2. The more rapid the conversion of carbon dioxide into carbon monoxide, the more effective the reduction of the iron ore to the state of metallic iron. Hence the coke which possesses the highest degree of reactivity is the best for this purpose.

Use of Coke in the Cupola

On the other hand, in the cupola furnace the coke is used merely as a fuel. A coke which possesses a low degree of reactivity is therefore the best for this purpose, as combustion takes place with the formation of carbon monoxide in its most effective form and the loss of heat which is brought about by the reaction between the carbon dioxide gas—thus formed—and the carbon of the coke is avoided that much more, the less capacity the coke has for entering into such a reaction.

The processes that take place in the gas producer, particularly as far as the rapidity of the combustion of the coke and the resulting decomposition of the carbon dioxide gas by the carbon of the coke to yield carbon monoxide are concerned, are dependent on the reactivity of the coke. The explanation of the lower combustion zone in the producers that are fired with lignite coal is therefore found in the fact that this substance, that is, after it has been tumefied in the upper part of the producer, possesses a high degree of reactivity, higher than that of small coke.

The Water Gas Process

The difference that exists between metallurgical coke and gas coke can probably be best told from the nature of the reactions that take place in the water gas generator. What is referred to particularly is the reactivity of the coke. When metallurgical coal is used in the process and the hot blast is turned on through the generator, a similar condition is attained as that which is found in the case of the cupola furnace. The coke burns to give carbon dioxide gas, but there is very little reduction of carbon dioxide to carbon monoxide. In other words, a large amount of heat is produced at a high rate of speed. Hence in the hot blast process the metallurgical coke is superior to the gas coke. On the other hand, in the gasification process the slighter reactivity of the metallurgical coke must be compensated for by a reduction in the speed at which steam is blown through the water gas generator. It is for this reason that when metallurgical coke is being used in the water gas, in order to obtain correct results in the gasification, it is necessary to maintain short blowing periods and long gasification periods. It is also possible to obtain good yields of gas per kilometer of coke employed and a small hourly load on the apparatus because of the necessarily lower speed at which the steam is blown through the apparatus. In this connection the end of the blowing period must not be determined as in the case where gas coke is being used, that is, by the carbon monoxide flame.

On the other hand, semi-coke which has a high degree of reactivity must be used for this purpose with longer blowing periods, and the formation of carbon monoxide gas is carried out at such a high rate of speed that there must be taken into consideration the usefulness of the blow gases, and shorter gasification periods with greater speed of steam admission to the generator must be followed out.

Water Gas in the Retorts

Finally when water gas is made by blowing steam into the retorts in which the coal has first been carbonized and there is left behind a hot mass of coke, the reactivity of the coke is again one of the most important factors that govern the gas-making process. If the coke has been quickly and thoroughly degasified in the carbonization process,—if it has been graphitized—then the formation of water gas in the retorts will be very little indeed. On the other hand, if the coke has been slowly and not completely degasified, then the formation of water gas will be rapid and copious. It has been observed in individual cases that only a slight degree of decomposition of steam was effected in the retorts. This observation, which is derived from actual practical experience with this process of making water gas, is perhaps clearly explained by the fact that the coke has been overheated and graphitized with the result that it has been made very deficient in reactivity.

The examples which are used for the purpose of deriving a conclusion on the relationship that might exist between the ignition temperature of the coke and its reactivity and the behavior of the fuel under different conditions may be multiplied almost at will. For example, it may be concluded that in the case of firing with ground coal, the essential points are the fineness of the coal dust, and particularly the uniformity of the grinding, if short flames are to be obtained without any excess of air. The finest particles ignite most easily. The larger particles of coal dust not only require a higher temperature for combustion, but the ignition temperature and the slowing up of the reaction increase still further with the decreased concentration of oxygen. Finally the combustion must proceed in the roundabout way through the reactions $CO_2 + C = 2CO$ and $2CO + O_2 = 2CO_2$.

Coking Capacity and Ash Content

The resistance of the coke to shock and crumbling, and at times the hardness and the strength of the coke, are properties which are directly associated with certain characteristics of the coal which are known as its coking or caking powers. The coking

power of a coal is dependent in a certain sense and to a certain degree on the percentage of incombustible matters that are contained in it; in other words, on the proportion of ash that it contains. Thus, for example, in the determination of the coking capacity of coal varying proportions of sand, anthracite coal, or electric carbon were added to the coke in increasing proportions until the mixture no longer yielded a coke that held together. The quantity of the sandy powders that may be added to the coal in this finest state of subdivision before the coal loses its coking power, are, to be sure, quite considerable and amount to several times the weight of the coal itself. Thus it may be stated that the use of coals that contain a high proportion of ash in admixture with regular good grade coking coals can have but little, if any, adverse effect on the coking properties of the coal, provided that the mixture is made with the ingredients in the finely pulverized condition.

But inasmuch as the presence of a large amount of ash in the coal is indicative of the admixture of a certain amount of non-combustible slate, the importance of this indication is to be found in another way. In the coking process, as well as in the quenching and cooling operations, which follow it in natural order, the presence of these foreign matters in the coal and thereafter in the coke have a very deleterious action on the homogeneity of the coke. They cause the formation of fissures and cracks in the mass of coke which eventually give rise to the splitting and crumbling of the product.

Further Effect of the Ash

Then again the presence of ash in the coal can give rise to the formation of various chemical substances which have a very pertinent action on the character of the coke that is produced in this manner. Thus, for example, the silicic acid or silica that is present in the coal ash can combine with the carbon to form carborundum or forms of this substance with the result that the coke becomes very hard. On the other hand, the presence of these substances in the coal and their combination to form these extremely hard combinations of carbon and silicon can have no favorable effect on the coking qualities of the coal. In fact, there is a decided deleterious action.

The Iron Compounds

Another important consideration has been the effect of the iron compounds in the ash on the processes that take place during carbonization. It has been suggested that the iron present in the coal ash has a catalytic action on the institution and maintenance of the combustion equilibria which have been explained above. This action is similar to an increase in the reactivity of the coke. However, it is not thought probable that the combustion process as such is dependent on the presence of iron in the coal ash. Finally, that the presence of ash in the coal and the nature of the ash exert a certain action on the formation of graphite from tar and gas within the mass of glowing coke may well be considered. The formation of graphite in the coke is an important matter in determining the properties of the coke and its usefulness for various industrial and domestic purposes.

THE "BUY YOUR OWN HOME" MOVEMENT

(Continued from page 442)

The bulk of the visitors at such exhibitions may not be in a position to purchase or to build homes at the time of their visit, but they carry the idea to someone else, and it is wrong to think they are not potential home dwellers and home builders. The display of house furnishings, home utilities, gas ranges, gas heaters and gas house heating systems all assist in the development of ideas and notions as to the proper design, construction and equipment of homes that will require gas.

A Display of Gas-Fired Central House-Heating Systems

Impressing the Young

The little youthful miss and her boy companion who visit these shows in large numbers may have little thought of the future, but each will be seriously considering the proper equipment to put into the kitchen in a very few years, and the impressions that they acquired at the "Buy Your Own Home" show will not be lost, but will recur in due time, as we all know. Some will be able to live in fine homes heated with gas-fired house-heating systems and some will live in apartments much more modest, but none will fail to require gas in their homes.

The visitors of mature years are more immediately concerned with the impressions gained at these shows and it is surprising when one mingles in the crowds to find how seriously persons are considering the matter of home buying or home building

when their appearance would hardly attract the attention of real estate agents who are looking for prospects.

The home building instinct is as old as the human race and it goes along with life in its manifold activities. Anybody having anything to offer that will make for more comfort and convenience in the home will find such an exhibition worth while.

This is especially true of great public service corporations whose work goes on year after year and whose life, while old in years, is always young in its growth and functions.

A Serious Movement

The "Buy Your Own Home" movement, far from being of a catch-penny nature, is a serious feature of city life, and it is important that the gas company aid in the proper conception and growth of the better home, not only in the suburbs, but in the built-up city as well. That is the spirit in which the gas company should appear as an exhibitor at these "Buy Your Own Home" shows. In the manifestation of that spirit the gas company is not only mindful of its part in the life of the mature generations of today, but in that of those that are yet to come.

DRY STERILIZATION OF MATTRESSES

(Continued from page 444)

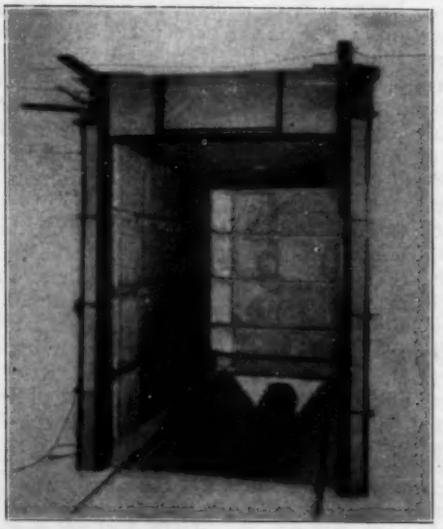
the combustion chamber and also into the path of the recirculating air from the oven. The heated air is blown from the combustion chamber into a large pipe which has two-inch perforations graduated to give a good distribution of heat. This pipe lays on saddles in a recess two feet deep in the bottom of the oven. In this manner the heat travels directly up through the articles being sterilized without a spot heat at any point, and the air again travels around to enter through the combustion chamber. The recirculation blower has capacity for completely changing the air in the room twice in one minute. A vent with a variable opening leads from the recirculating pipe to eliminate disagreeable odors and products of combustion.

Charging the Sterilizer

Charging is done by means of a truck constructed of channels and strap iron and running on wheels fitted with ball bearings for easy operation. To minimize the loss of heat from the oven during the charging operation the rear of the truck is fitted with a set of spring operated flaps bearing on the inside of the doorway when the truck is in the loading position, and completely closing the doorway. The position of the truck is controlled by blocks inside and outside the room. Tracks are set for running the truck in the correct position over the firing pipe inside the oven. Twelve mattresses may be sterilized in one load.

Temperature Control

Temperature control and automatic operations are provided by a thermostat operating in the air supply to the surface combustion inspirator, which with its one valve control and wide range of operation at a high efficiency adapts itself particularly to control of this type. The thermostat is specially built for a temperature range of 60 to 250 degrees Fahrenheit and operates in connection with Minneapolis control equipment to open or close a snap action valve on the main air line. The valve is by-passed to give the minimum capacity after the oven has come up to heat. Thus we have an oven that requires no attention after lighting and one that maintains the correct conditions for sterilizing. The capacity of the oven is 170 mattresses per day of eight hours. The amount of fuel per mattress is 15 cubic feet of gas, while the power for motors adds .2 K.W. to this figure. One man can operate one oven and run the plant.



Interior of Sterilizing Plant

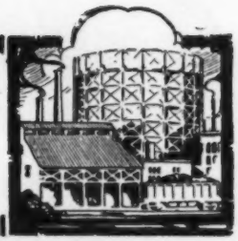
Particular Adaptability of Gas

On an installation of this type gas is particularly adapted. It permits of direct firing with resulting economy. It is clean, a characteristic absolutely essential in sterilizing. It allows of easy and accurate control, a merit desirable both in fuel economy and ease of operation.

GAS ENGINEERS' COMPENDIUM

D. Van Nostrand Company, New York, has published a book which is of considerable interest to gas men. It contains various useful and practical information regarding gas manufacture instructions and gas plants, and gas plant equipment, distribution of gas, purification of gas, use of various materials of construction in the gas plant, etc., etc. It contains numerous tables of mathematical and physical character which are very useful to the gas man. However, it must be mentioned that a certain number of these tables contain information derived from British practice which are not directly applicable to American practice. But in spite of this drawback, the book possesses considerable value to gas men everywhere.

NEWS OF THE GAS INDUSTRY



Natural Gas Men Meet

The 20th annual meeting of the Natural Gas Association of America was held during the week commencing May 18 and ending May 21, on the Steel Pier at Atlantic City. An interesting program was arranged for these meetings, including not only business matters, but entertainment as well. The members of the Natural Gas Association of America traveled from far and near to attend this meeting. There was also a fine set of exhibits of various equipment and appliances used by natural gas companies as well as by domestic and industrial consumers of the fuel.

Among the entertainment features was an exhibition of swimming and diving at the Hygeia Pool on Monday night. National champions gave fine exhibitions of swimming and diving, particularly Aileen Rigger, Helen Wainright, Helen Meaney and Gertrude Ederle.

The annual dinner of the association was held on Wednesday night at the Traymore Hotel. The guests of the evening were W. B. D. Ainey, president National Association of Railways, and Public Utility Commissioner of Harrisburg, Pa., John Gribbel of Philadelphia and William Scott of Brookline, Mass.

At the business meetings all phases of the natural gas industry were discussed, such as the operations in the field, distribution and sale of the gas, general conditions of the industry, house heating and industrial gas, etc. The various committees also reported on work for the past year, these being the main feature of the program on Thursday, May 21.

Michigan Supreme Court Sustains Right of Gas Co. to Fix Reasonable Rates

A very interesting and important decision was recently filed in the Supreme Court in the State of Michigan, regarding the common law right of the gas company to fix and promulgate reasonable rates. This is in absence of applicable provisions of regulatory procedure. The decision of the court was unanimous.

Illinois Power & Light Corp. in Consolidation

Granite City, Mo.—Announcement has just been made here by Louis D. Daly, manager of the Illinois Power & Light Corporation, gas department, that, effective June 1, both gas and electric offices of the company of this city will be combined.

Due to the confusion caused by the handling of two separate accounts by the power corporation, it was decided to combine the two offices in order to more facilitate the handling of the business of the company.

This will permit the consumers to transact all their business of both gas and electric through one office, instead of two, as formerly, and will save time in making remittances for service or in making purchases from either company.

In making this announcement Mr. Daly also states that he is resigning his position as manager of the gas department, effective June 1, and is planning to enter other business in the commercial line, as it is his desire to leave the public service field. It is not known at this time who will succeed Mr. Daly.

Gas Sales of N. E. Holds Annual Meeting

Winners of Prizes on House Heating Articles Announced

The annual meeting of the Gas Sales Association of New England was held at the Boston City Club on Friday, May 8, 1925. In opening the meeting Governor Quinn called attention to the fact that this was the banner meeting of the year as far as attendance was concerned, there being 200 members and guests present. A number of manufacturers of gas appliances were seated at the head table and, although not called upon to speak, these manufacturing men take a great deal of interest in the work of the Gas Sales Association.

Mr. S. T. MacQuarrie, director of the New England Bureau of Public Service Information, told about the coming 300th anniversary of the settlement of Quincy, which will be held during the week of June 7. Mr. McQuarrie urged all gas men to come to Quincy during that week and see the wonderful pageant, parades, etc.

An invitation was read to the meeting from the Southern Gas Association, inviting members of the Gas Sales Association to attend the conference to be held at the Ocean Hotel, Wilmington, North Carolina, on June 9, 10 and 11. This meeting will be under the direction of the Southern Gas Association and many interesting speakers have been secured to address the meeting.

Industrial Gas Class at M. I. T.

Governor Quinn called attention to the Industrial Gas Class, to be held at the Massachusetts Institute of Technology from June 22 to July 3. He asked that all men who were contemplating taking this course to send in their enrollment blanks right away, as it was necessary for the committee to know just how many were to take the course. Governor Quinn also outlined the plans of the Com-

mercial Section of the American Gas Association relative to a Sales Conference to be held at Gloucester, Mass., June 2, 3, 4 and 5. National speakers have been secured and the governor urged all members of the Gas Sales Association to attend this conference.

Ex-Governor Woodhead stated that Mr. F. K. Wells was still sick in the hospital. The association expressed regret and it was voted to send Mr. Wells a suitable remembrance.

Mr. Woodhead then called upon ex-Governor Pettengill to step forward to the speaker's table, and in a few well chosen words presented Mr. Pettengill with a gold fountain pen from the members of the association in appreciation of the services which he had rendered during the past year. Mr. Pettengill has conducted the community singing at the meetings and has always obtained good results. In responding, Mr. Pettengill thanked the association for the gift and stated that he was very glad to render what service he could in making the meetings a success.

Report on House Heating

Mr. M. B. Webber, chairman of the Committee on House Heating, presented the following report:

"Your committee has carefully considered all the paper submitted, each having studied carefully each and every entry. The winners were selected by a system of points of credit for the various phases as outlined in the notice. More points were allowed for the sales portion than for the engineering or description. In the consideration of the papers they were referred to by members applied to them as received rather than by authors.

"The two best papers, while differing widely in style, are considered by the committee after a very careful analysis equal in value to the industry in New England and we are, therefore, pleased to award each $100. The winners are:

"J. N. Howard, Blackstone Valley Gas & Electric Co., Pawtucket, R. I.

"A. L. Flanders, Lowell Gas Light Co., Lowell, Mass.

"The following entrants deserve honorable mention for the service rendered the industry through the valuable information contained in their papers:

"Stuart D. Brown, Fall River Gas Works Co.

"William K. Curtin, Pawtucket Gas Co.

"J. C. Elder, Pawtucket Gas Co.

"Henry L. Nickerson, Blackstone Valley Gas & Electric Co.

"Elliott C. Peabody, Fall River Gas Works Co.

"R. J. Phelan, Worcester Gas Light Co.

"Robert D. Stuart, Jr., Blackstone Valley Gas & Electric Co.

"H. A. Teel, Spencer Gas Light Co.

"John J. Winn, Jr., and Herbert S. Brasseur, Haverhill Gas Light Co."

In presenting the money to the winners, Governor Quinn commented upon the fact that both of the winners were members of the Industrial Gas Class held at the Massachusetts Institute of Technology.

The Membership

The report of Mr. J. H. Sumner, secretary-treasurer, was most interesting and showed that the association was in a healthy and prosperous condition. The following shows the report of the membership:

Members one year ago.....	172
Taken in during the year.....	26
Total	200
Withdrawn (95% of these men have moved to other territory) 22	
Deceased 1	
Dropped for non-payment of dues 5	
—	28
Total active membership...	172

At the meetings held last year there was an average attendance of 158 members and guests, which shows an average of 73 per cent of the members attending; this is an increase of 3 per cent over last year; 73 per cent of members attending is considered a very good attendance.

Governor Quinn then called upon the auditing committee, which reported that they had examined the books of the secretary-treasurer and had found them satisfactory and in accord with the report as rendered by the secretary-treasurer.

In appreciation of the efforts which Mr. Sumner had given to the association during the past year he was presented with a large bouquet of American Beauty roses.

New Officers

One of the features of the evening was the report of the nominating committee. This was given by Mr. William Gould and was given in a manner and way which only "Bill" can give. It was the committee's opinion that Governor Quinn should be allowed to continue on with his good work for another year, and he, accordingly, was nominated for governor. For the board of managers the committee brought in the names of J. H. Sumner, J. A. MacPherson and Walter Stafford. The association voted that the secretary be instructed to cast one ballot, which he did, and the above gentlemen were elected.

Each of the elected responded in a few words, stating that they would endeavor to give the best they had during the coming year so that the association may continue to prosper and be of benefit to the gas industry.

At intervals during the evening music was furnished by the Belmont Four Quartette from the Boston Consolidated Gas Co., composed of Messrs. Donagher, Young, Barry and O'Neil. At the conclusion of their singing they were given three cheers by the members.

Michigan Gas Association to Meet June 25-27

Attention is called to an error made in the dates of the meeting of the Michigan Gas Association in a recent issue of the American Gas Journal. The association will meet on June 25, 26 and 27.

Southwestern P. S. Association Holds 30th Annual Convention

Comprehensive Program Arranged for Gas Section

The 30th annual convention of the Southwestern Public Service Association was held in Houston, Texas, from May 5 to 8, inclusive. About 600 delegates, including many gas men, were present at the meeting.

The convention was opened with a welcoming address by Mayor Oscar F. Holcombe of Houston, Texas. An address was also delivered by Judge Clarence Wharton of Houston. The meeting was then addressed by the president of the association, G. W. Fry, of Abilene, Texas, president of the West Texas Utilities Co. There were two papers read at the opening general session, one by Mr. Herbert Metz of New York, on "Advertising and Good Will," and the other by Mr. Keith Clevenger, director of public relations, Empire Companies, Bartlesville, Oklahoma. General sessions were held also on Wednesday morning, Thursday afternoon and Friday afternoon, at times which did not conflict with meetings of special sections. Many interesting papers on general utility subjects were presented at these meetings and at the Wednesday morning meeting Mr. H. C. Abell of New York, president of the American Gas Association, delivered an address on "Our Servant—Gas."

Numerous papers were also read at the Wednesday afternoon, Thursday morning and Friday morning sessions of the Gas Section.

The new officers elected for the coming year were:

W. E. Wood, general manager of the Houston Electric Co., president of the association; first vice-president, P. E. Nichols, vice-president and general manager of the Galveston Gas Co.; second vice-president, J. C. Kennedy, president and general manager of the East Texas Public Service Co. of Marshall, Texas; third vice-president, W. W. Holden, superintendent of railways, San Antonio Public Service Co.; and treasurer, F. J. Gannon, assistant treasurer Northern Texas Traction Co., Fort Worth.

Members of the executive committee elected for the two-year term were: F. M. Hogue, general manager of the Southwestern Bell Telephone Co., Dallas; T. H. Williams, manager of the Texas Power & Light Co., Waco; F. C. Armbruster, superintendent of gas for the Southwestern Gas & Electric Co., Shreveport; and B. F. Cherry, general manager of the Weatherford Water, Light & Ice Co.

Correspondence Course in Gas Starts in September

Prof. Morgan of Columbia University to Direct Work

The American Gas Association recently announced that it would work in conjunction with the authorities in Columbia University, in arranging a correspondence course on manufactured gas. This is an enterprise which deserves the highest commendation and which it is felt will be eminently successful.

The American Gas Journal has always stood for progress in gas, particularly in the education of gas men and employees in the fundamental outlining of the manufacture, distribution and the use of gas. In our issue of December 16, 1922, there was published an editorial entitled "Training Gas Engineers," in which there was discussed the advisability of a correspondence school for teaching gas engineering. At that time there was a question whether or not such a course would be successful, and the opinion of readers was invited.

The course which will start in September, 1925, under the direction of Dr. Jerome J. Morgan of Columbia University, will cover the fundamental principles of gas manufacture and distribution, with something as well on the utilization of gas. There will be 24 lessons in all, one lesson a month, and each lesson will require from six to ten hours' work. The cost of this course will be $60 inclusive of textbooks. An advisory committee acting as a sub-committee of the committee of Educational Gas Company Employees of the American Gas Association, has been formed to advise with Dr. Morgan and to assist in every way possible in promoting this course. The members of the advisory committee are F. C. Weber, A. Forstall, C. E. Paige and W. S. Yard.

The lessons which will be given are as follows:

1. Physical properties of gases; brief history of gas manufacture; general outline of the function and purpose of the manufactured gas business; bibliography.

2. Gaseous fuels and their composition; components of manufactured gas; theory of combustion; producer gas; gas producers; recuperation and regeneration.

3. Coals, their formation and classification; composition of coals suitable for coal gas; theory of coal carbonization; flow sheet and general outline of coal gas plant.

4. Description of carbonization apparatus — standard benches; horizontal thrus; inclines; verticals; design, construction and operation of each.

5. Coke ovens; design, construction and operation.

6. Water gas theory; composition and constitution of water gas making materials—coal, coke and oil; steam boiler plant design, construction and operation; accessories.

7. Description of water gas process; design of the machine; operation of water gas apparatus; controls; waste heat boilers.

8. Carburetter reactions; cracking of hydrocarbon oils: relation

of oil cracking to coal tar cracking; napthalene.

9. Manufacture of oil gas as practiced on the Pacific Coast.

10. Condensing and scrubbing, with especial reference to tar and ammonia removal and recovery; distillation of ammoniacal liquor.

11. Oxide purification — materials, size and types of boxes; methods of operation; liquid purification—theory, apparatus and results.

12. Developments in the art of gas manufacture and problems to be met in the future; low temperature carbonization and complete gasification.

13. Gas distribution, with especial reference to main conductivity; pressure surveys and data; main capacities.

14. Gas pumping machinery; high pressure distribution.

15. Gas services; meters and governors; unaccounted for gas.

16. Proper function and operation of a new business department.

17. Appliances; design, installation, performance and adjustment; house piping.

18. Theory of gas utilization; flame temperature; heat transfer; ventilation; recuperation.

19. Use of gas for industrial purposes and problems attendant thereto.

20. Function of the chemical laboratory in gas manufacture and utilization.

21. Accident prevention, safety and first aid.

22. Importance of relation of accounting and statistical records in reference to construction and operation.

23. Principles of rate making; fair value; valuation; undistributed structural costs; going concern value.

24. Public relations.

Utility Men Plan National Research to Develop Industrial Gas Equipment

Atlantic City, N. J.—The establishment of a national research organization to make gas available to all industrial fuel users was the proposal made at the annual spring conference of the American Gas Association by Charles A. Munroe, chairman of the board of the Laclede Gas Light Co. of St. Louis and a former president of the association.

As outlined by Mr. Munroe, the objects of the new organization, to be underwritten by the manufactured gas companies of the country, would be to develop efficient gas burning equipment for all fuel users in industry and enable the gas companeis to meet the demand for gas fuel wherever heat is required.

It is understood that Mr. Munroe has the support of other leading public utility executives for his project, and that leaders of the gas industry are studying its details with the greatest interest.

Gas Will Eventually Shoulder Heating Burdens of Country

"The present tendency to conserve our national resources, especially oil and natural gas, makes it inevitable that the manufactured gas industry will have to shoulder the heating burdens of the country," he said. "The gas industry is now equipped to supply all the immediate fuel requirements for industry, millions of dollars having been spent for improvements and new construction during the past two years.

"We must now go a step farther by developing gas-burning appliances to make gas the universal fuel, as it is now the most economic medium for even the most intricate and exact of heating operations.

"Although 25 per cent of the present output of manufactured gas in this country is being used in industry, the majority of industrial fuel users are still either employing wasteful and outworn methods of combustion or have been forced to turn to electricity, a power producer, in spite of the fact that electricity costs three times as much as gas and also in spite of the fact that electric appliances cost twice as much as gas appliances.

"Heretofore no one has been able to spend enough time and money to develop the proper appliance for the utilization of gas fuel in industry. As the demand for gas is increasing, the immediate development of such appliances become an obligation."

Mr. Munroe proposed that a fund be provided to finance an organization to carry on research along these lines over a period of five years. He stated that there are companies now engaged in manufacturing industrial appliances which could undertake this work and carry it to a successful conclusion.

W. E. HERRING SUCCEEDS L. R. DUTTON

Philadelphia Suburban Gas & Electric Co. Announces Appointment

Jenkintown, Pa. — Willard E. Herring, assistant division manager of the Philadelphia Suburban Gas & Electric Co., became the division manager on May 1, in place of L. R. Dutton.

Mr. Herring has had a wealth of practical experience in the utility field, having been associated with the firm of Stone & Webster of Boston, the country's largest operators of public utilities, for nine years prior to his coming to the suburban section. Before then he had charge of heavy and difficult utility construction work in the middle and far West.

His whole personality is wrapped up in serving the suburban section well.

"I want to get in even more intimate touch with the people we serve," he explained. "I want to know their problems and I want to do what I can to serve them.

"Our big job is to sell satisfactory service to satisfied consumers. That, after all is said and done, is the job of any utility."

Mr. Herring said the suburban company is planning a record-breaking amount of building this year. He said many gas mains and electric lines will be extended to keep up with the growth of the residential and business district.